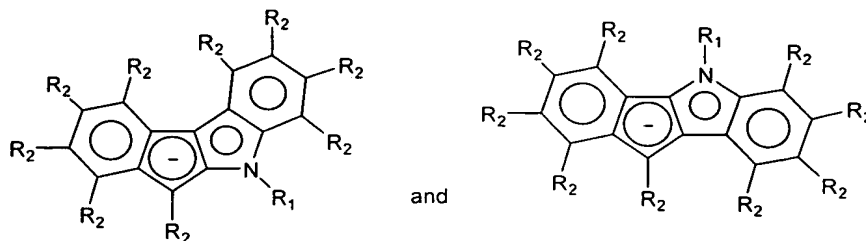


We claim:

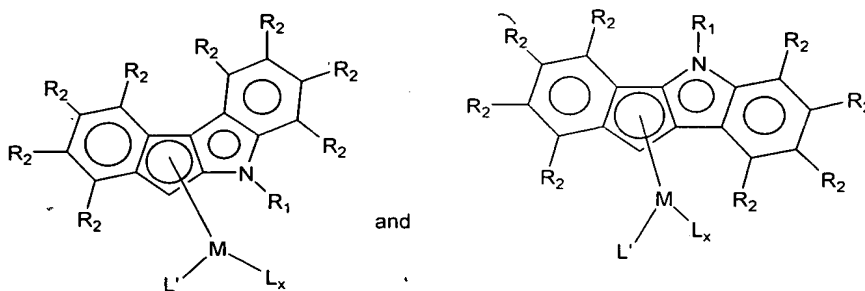
1. A process which comprises polymerizing an olefin in the presence of an activator and an organometallic complex, wherein the organometallic complex comprises a Group 3 to 10 transition metal, M, and at least one non-bridged indenolindolyl ligand that is bonded to M wherein the substituent on the indole nitrogen of the indenolindolyl ligand contains an atom selected from the group consisting of S, O, P, and N.
2. The process of claim 1 wherein the Group 3 to 10 transition metal is a Group 4 transition metal.
3. The process of claim 1 wherein the activator is selected from the group consisting of alumoxanes, alkylaluminum compounds, organoboranes, ionic borates, ionic aluminates, aluminoboronates, and mixtures thereof.
4. The process of claim 1 wherein some or all of the activator is premixed with the organometallic complex prior to addition to the support material.
5. The process of claim 1 wherein the olefin is selected from the group consisting of ethylene, propylene, 1-butene, 1-pentene, 1-hexene, 1-octene, and mixtures thereof.
6. The process of claim 5 wherein the olefin is ethylene in combination with a second olefin selected from the group consisting of 1-butene, 1-hexene, and 1-octene.
7. The process of claim 1 wherein the substituent on the indole nitrogen contains an ether group.
8. The process of claim 1 wherein the substituent on the indole nitrogen contains a tertiary amine group.
9. The process of claim 1 wherein the substituent on the indole nitrogen contains an aromatic ring substituted with an ether group.
10. The process of claim 1 wherein the complex is supported on silica.
11. The process of claim 1 wherein the polymerization is performed at a temperature within the range of about 30°C to about 100°C.

12. A slurry polymerization process of claim 1.
13. A gas-phase polymerization process of claim 1.
14. The process of claim 1 wherein the indenoindolyl ligand has a structure selected from the group consisting of:



in which R_1 is a C_2 - C_{30} radical containing an atom selected from the group consisting of S, O, P, and N; each R_2 is independently selected from the group consisting of C_1 - C_{30} hydrocarbyl, H, F, Cl, and Br.

15. The process of claim 1 wherein the organometallic complex has a structure selected from the group consisting of:



wherein M is a Group 3 to 10 transition metal; each L is independently selected from the group consisting of halide, alkoxy, aryloxy, siloxy, alkylamino, and C_1 - C_{30} hydrocarbyl; L' is selected from the group consisting of alkylamido, substituted or unsubstituted cyclopentadienyl, fluorenyl, indenyl, boraaryl, pyrrolyl, azaborolinyll, and indenoindolyl; x satisfies the valence of M; R_1 is a C_2 - C_{30} radical containing an atom selected from the group consisting of S, O, P, and N; and each R_2 is independently selected from the group consisting of C_1 - C_{30} hydrocarbyl, H, F, Cl, and Br.

16. The process of claim 15 wherein L' is selected from the group consisting of substituted or unsubstituted cyclopentadienyl, fluorenyl, indenyl, and indenoindolyl.
17. The process of claim 15 wherein R₁ contains an aromatic ring substituted with an ether group.